Dian Atnantomi Wiliyanto, Abdul Salim, Nunuk Suryani. (2017). Title of Manuscript. *Journal of Education and Learning.* Vol.11 (4) pp. 460-467. DOI: 10.11591/edulearn.v11i4.6088

The Use of Web Based Expert System Application for Identification and Intervention of Children with Special Needs in Inclusive School

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Abstract
This research is conducted to determine the effectiveness of web based expert system application for identification and intervention of children with special needs in inclusive school. 40 teachers of inclusive school in Surakarta participated in this research. The result showed that: (1) web based expert system application was suitable with the needs of teachers/officers, had 50% (excellence criteria), (2) web based expert system application was worthwhile for identification of children with special needs, had 50% (excellence criteria), (3) web based expert system application was easy to use, had 52.5% (good criteria), and (4) web based expert system application had result accuracy in making decision, had 52.5% (good criteria). It shows that the use of web based expert system application is effective to be used by teachers in inclusive school in conducting identification and intervention with percentage on average was more than 50%.

Keywords: *Expert System, Identification, Inclusive School*

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Introduction

Education for all is an implementation of education accommodating every individual. Inclusive schools become school model accommodating all children with no exception in one class which considers students' ability and needs (UNESCO, 2000). Inclusive schools are schools providing education program which accommodates all students in the same class according to their age and development (Schmidt & Venet, 2012). Inclusive schools deliver education service which give chance for children with special needs to study together in regular class (Sapon-Shevin, 2007).

Children with special needs possess different characteristics for every impairment or disability; therefore, they need intervention and modification of curriculum for every characteristic. UNESCO (2000) states that inclusive education involves some learning services, namely change and modification of the content, approach, structure and strategy, with a vision covering all children in the same group of age and a believe that inclusion is responsibility of regular system educating every student."

The various characteristics of children with special needs require identification process to decide the kinds of impairment and disability they possess, so that the intervention given should be appropriate with children's needs and ability. Identification is a process to discover information about problems faced by children to arrange suitable education intervention covering class placement and curriculum (Lebeer et al, 2010). Suitable identification aims to give choices of suitable learning intervention appropriate with characteristics, abilities, and disabilities owned by children with special needs (Guarino et al, 2010).

With proper services, those children learning in inclusive school will not face difficulties to adjust in learning together with regular students. Basically, learning intervention is very important to optimize children's ability, because every child is born with ability, even children with special needs (Karsidi, 2015). Proper intervention for children with special needs can minimalize their problems and disabilities in the learning process in class. The importance of identification and intervention for children with special needs becomes a focus for teachers teaching in inclusive school to understand suitable intervention which is needed by children with special needs having problems to learn in class. Learning identification and intervention for those learning in inclusive school seem to be not understood by teachers in inclusive school yet. Bukvic (2014) mentions that there are 70% teachers from 100 teachers do not own competence in teaching children with special needs viewed from identification, giving intervention, and understanding the students' characteristics. Teachers' readiness in giving learning method is very crucial in teaching students with special needs (Zulfija, 2013). Based the data of children with special needs in 2011, it is noted in Education Ministry in Indonesia that there are 356.192 children with special needs; however, there are only 86,645 children who receive service, and up to this year, there are only 105,185 children (Desiningrum, 2016).

Difficulties faced by teachers in performing identification and intervention need supporting tools helping teachers' performance in doing identification and intervention in inclusive school. The use of expert system is a computer based system using knowledge, fact, and reasoning technique in solving problem that can be usually solved only by expert system in particular field and giving a decision about a problem (Ignizio, 1991). Advantage in using expert system in education is to solve students' learning problem, so that teachers can give suitable intervention according to problems faced by students (Goodarzi & Rafe, 2012). In this research, it will be developed a web based expert system which is expected to give ease for teachers in performing learning identification and intervention for children with special needs. In previous study, web based expert system can deliver information of all factors and obstacles or problems to determine kinds of intervention and students' assessment (Choudhury et al, 2012). Problem solving for students is the main focus in web based expert system, since the information come from identification process covering characteristics, placement, learning media, evaluation, and problems faced by students (Albalooshi & Shatnawi.,2010; Feghali et al., 2011). Information containg students' condition from web based expert system can be reference to help teachers' duty in inclusive school in performing learning intervention. Based on the problem background above, researchers expect development of the use of web based expert system application can be used for identification and intervention of children with special needs in inclusive school.

Research Method

This research used R & D (Research and Development) method. The role of R & D research is to develop web based expert system application that can be used for identification and intervention for children with special needs in inclusive school. 40 teachers of inclusive school in Surakarta, Indonesia participated in this research. In this research, the participant answered questionnaire about the use of web based expert system application. The questionnaire used Likert scale (4: excellence, 3: good, 2: fair, and 1: poor)

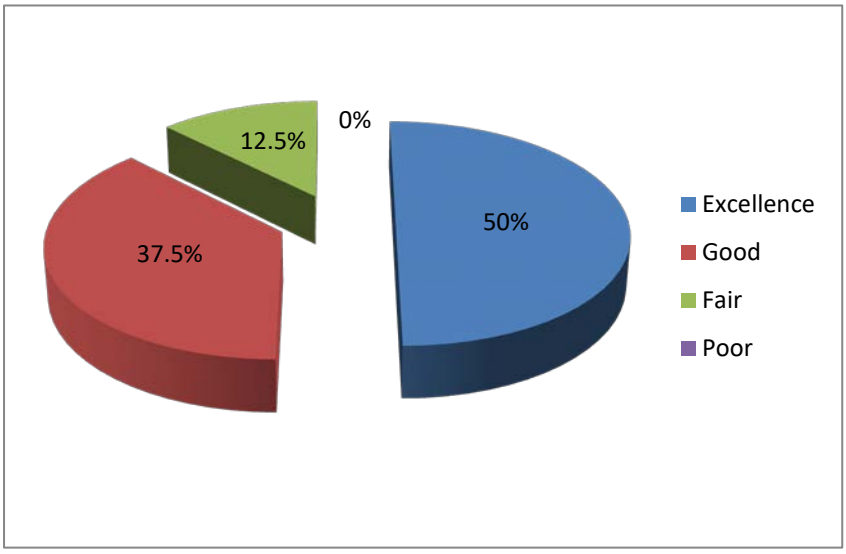
Results and Discussions Results

Below is result about development of the use of web based expert system application that can be used for identification and intervention of children with special needs in inclusive school.

Web based expert system application according to needs of teachers/officers

Assessment	Total	Percentage
Excellence	20	50 %
Good	15	37,5 %
Fair	5	12,5 %
Poor	0	0%
Total	40	100%

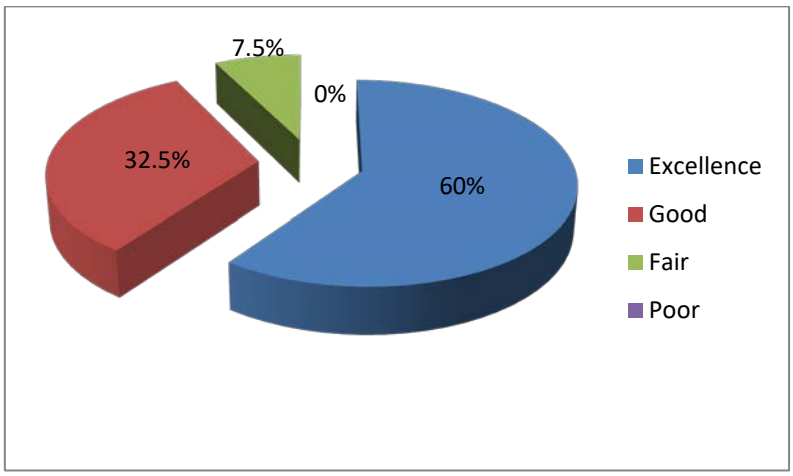
From table 1 above, it can be known that from total 40 respondents about assessment of web based expert system application according to needs of teachers/officers, 20 respondents response with excellence, 15 respondents response with good, 5 respondents response with fair, and 0 respondents response with poor. In the form of percentage, 50% respondents response with excellence, 37.5% respondents response with good, 12.5% respondents response with fair, and 0% respondents response with poor. It can be presented in the form of diagram as follows:



Web based expert system application useful for identification of children with special needs

Assessment	Total	Percentage
Excellence	24	60 %
Good	13	32,5 %
Fair	3	7.5 %
Poor	0	0 %
Total	40	100 %

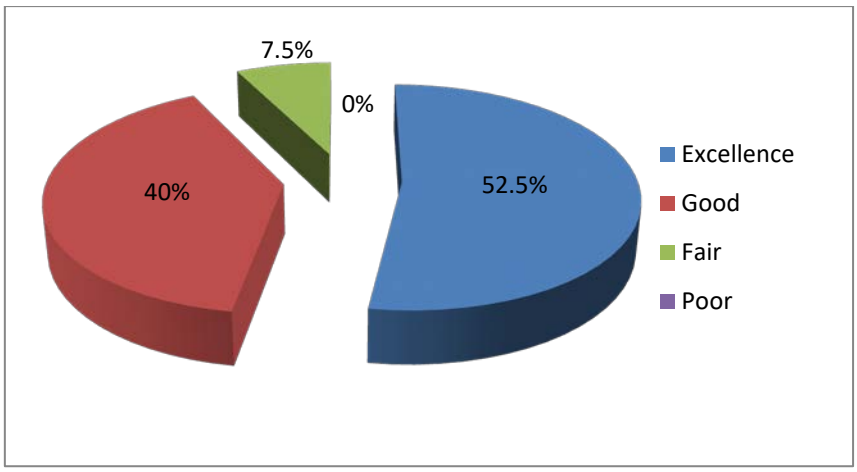
From table 2 above, it can be known that from total 40 respondents about assessment of web based expert system application useful for identification of children with special needs, 24 respondents response with excellence, 13 respondents response with good, 3 respondents response with fair, and 0 respondents response with poor. In the form of percentage, 60% respondents response with excellence, 32.5% respondents response with good, 7.5% respondents response with fair, and 0% respondents response with poor. It can be presented in the form of diagram as follows:



Web based expert system application easy to use

Assessment	Total	Percentage
Excellence	21	52.5 %
Good	16	40 %
Fair	3	7.5 %
Poor	0	0 %
Total	40	100 %

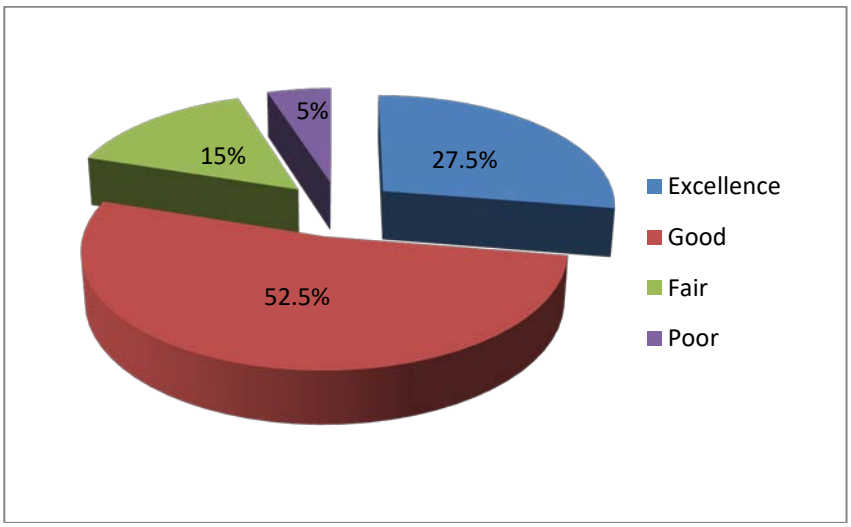
From table 3 above, it can be known that from total 40 respondents about assessment of web based expert system application easy to use, 21 respondents response with excellence 16 respondents' response with good, 3 respondents response with fair, and 0 respondents' response with poor. In the form of percentage, 52.5% respondents response with excellence, 40% respondents response with good, 7.5% respondents response with fair, and 0% respondents response with poor. It can be presented in the form of diagram as follows:



Web based expert system application has result accuracy in making decision

Assessment	Total	Percentage
Excellence	11	27.5 %
Good	21	52.5 %
Fair	6	15 %
Poor	2	5 %
Total	40	100 %

From table 3 above, it can be known that from total 40 respondents about assessment of web based expert system application has result accuracy in making decision, 11 respondents response with excellence 21 respondents response with good, 6 respondents response with fair, and 2 respondents response with poor. In the form of percentage, 50% respondents response with excellence, 40% respondents response with good, 7.5% respondents response with fair, and 2.5% respondents response with poor. It can be presented in the form of diagram as follows



Result and Discussion

The use of web based expert system application creates very high percentage, where the average of percentage was more than 50% the use of application can ease teachers in performing suitable identification and intervention for children with special needs.

Identification

Identification is a process to discover information about problems faced by children to arrange suitable education intervention covering class placement and curriculum (Lebeer et al, 2010). Suitable identification is useful to provide learning interventuin choices according to characteristics, abilities, and disabilities of children with special needs (Guarino, et al, 2010). Steps in performing identification are (Direktorat PSLB, 2007):

a. Gathering children's data
   In this step, identification officers gather all children's data in class according to their symptom by using identification tools for children with special needs.
b. Analyzing data and classifying children
   This step is used to discover children classified into children with special needs based on the result from data gathering step by observing their symptom appearing in class.
c. Informing analysis and classification result
   The result of analysis and classification made by identification officers is reported to headmaster, students' parent, and school committee council. This step is used to obtain problem solving suggestions and follow-up of the program.
d. Conducting cases discussion
   In this step meeting is held coordinated by headmaster after all data of children with special needs is gathered and analyzed. Headmaster involves teachers, students' parents, doctor, psychologist, and special teacher. This meeting discusses identification analysis result to obtain suggestion about how to deal with children with special needs.
e. Performing intervention
   Identification analysis is used to perform suitable intervention according to students' ability and identification result.

Intervention

Intervention as follow-up of identification process is highly important to give suitable services according to students' needs and ability. It is proved by research that intervention can improve ability of language, calculate, and solve behavior problems of children with special needs (Meadan,et al.,2016; Kilgus.,2015). Early intervention of children with special needs has positive effect in the development of education in inclusive school (Kaminski & Powell-Smith., 2016., Zheng et al., 2015). Some criteria that are can be used to arrange intervention program for children with special needs are: (Desiningrum, 2016)

a. Research or value based practices
   Intervention program is better based on effective techniques. When there are no proves used from research, then intervention program is better based on value based practices that has been conducted by education administrator for children with special needs.
b. Family centered practices
   Intervention program is based on family namely parents, siblings, and family member as a whole integrated unity.
c. Multicultural perspective
   One important thing in early intervention is that educator or experts take multicultural perspective, because parents are usually stressed in admitting condition of children with special needs.
d. Collaboration of cross-disciplinary
   It is a collaboration inter-experts or educators to give suitable services for children with special needs according to their own expertise.
e. Developmentally and chronologically age appropriate practices
   This step is suitable education method development for children with special needs according to their chronological age.
f. Normalization principal
   This principal is used to give support for the children so that they can actively involve in their community normally or naturally.

Expert system application

Expert system can be used as learning supporting tools in understanding hard lesson and give problem solving faced by students (Feghali et al, 2011). In this case, the use of expert system in educational world can be implemented as learning media such as mobile learning or m-learning for students and can support to solve problems in learning faced by students (Asabere & Enguah; Ghadirli & Rastgarpour, 2012). Determination of class for new students can be done by expert system application, where the system gives class recommendation and suitable learning model for students according to their intellectual condition (Bouaiachi et al, 2014; Al-Ghamdi et al, 2012). Another study mentions that expert system becomes a system used to give recommendation of academic plan about suitable lesson choices appropriate with their condition (Al Ahmar, 2011).

Students' characteristics are identified. Expert system can be used as suitable training recommendation based on education record stored in database and it is useful in solving learning problems faced by students (Daramola et al, 2014). The use of web based application is to determine recommendation of lesson schedule and standard level and also gives training recommendation or suitable intervention based on their intellectual condition (Albalooshi & Shatnawi, 2010). Suitable curriculum decision appropriate with their condition can be assisted by web based application which gives decision accurately (Lightfoot, 2014). In the assessment process or web based expert system assessment, it can give evaluation of students' learning result developed or designed before (Choudhury et al, 2012, 2013). Web based application provides data archives used to decide criteria of assessment standard and suitable intervention based on students' condition (Yorulmaz, 2012).

Conclusion

The use of expert system application in general be able to assist teachers duty in inclusive school in conducting suitable identification and intervention appropriate with students' needs and ability with percentage as more than 50% (excellence criteria). It will help students with special needs to develop according to their ability maximally. Based on data, conclusion can be drawn that the use of web based expert system application as follows.

a. Web based expert system application is suitable with teachers'/officers' needs; it has percentage for 50% (excellence criteria).
b. Web based expert system application is worthwhile for identification of children with special needs; it has percentage for 60% (excellence criteria).
c. Web based expert system application is easy to use; it has percentage for 52.5% (excellence criteria).
d. Web based expert system application has result accuracy in making decision; it has percentage for 52.5% (good criteria).

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